ACCREDITED
CERTIFICATE #5473.01

Test Report No.:
FCC2022-0035-RF/R3

TEST REPORT

FCC ID	:	2AK43RD-836
Applicant	:	Guangzhou Rigal Electronics Co., Ltd.
Product Name	:	Multimedia Projector
Mode No.	:	RD-***(***for 0-9), ACE K1

CVC Testing Technology Co., Ltd.

Applicant	**Name:** Guangzhou Rigal Electronics Co., Ltd. **Address:** Floor 1, Floor 2, Floor3, Factory Building, No.30, The north of Hongmlandadao, Xiuquan Street, Huadu District, Guangzhou
Manufacturer	**Name:** Guangzhou Rigal Electronics Co., Ltd. **Address:** No.3, Ruixiang Road,Huadu District,Guangzhou
Equipment Under Test	**Product Name :** Multimedia Projector **Model No. :** RD-***(***for 0-9), ACE K1 **Trade mark : —** **Serial no. : —** **Sampling :** 1-1

Date of Receipt.	**2022.06.29**	Date of Testing	**2022.08.30**

Test Specification	**Test Result**
FCC CFR47 Part 15C (2020) Radio Frequency Devices ANSI C63.10 (2013) DA00-705 Filing and Frequency Measurement Guidelines For Frequency Hopping Spread Spectrum System (2000).	PASS

Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied. **Seal of CVC** **Issue Date: 2022.10.13**

Tested by:	Reviewed by:	Approved by:
Xu Zhenfei	**Liu YongHai**	**Chen HuaWen**

Other Aspects: NONE.

Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of **CVC**.
This report replaces the report No.FCC2022-0035-RF/R2 after issuance.

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1. General Product Information

1.1 General information

Product Name	Multimedia Projector
Model No.	RD-836
Additional model	RD-***(***for 0-9), ACE K1
Power Supply	AC100-240V~ 50/60Hz
Antenna Type	Internal Antenna
Antenna Connector	A detachable antenna
Antenna Gain	1.42 dBi (provided by client)
Frequency Range	2402MHz~2480MHz
Bluetooth Version:	BT5.0
Channel Number	79
Type of Modulation	GFSK, π/4DQPSK, 8DPSK
Hopping Channel Type:	Adaptive Frequency Hopping systems
Max. Conducted Power	DH5: 4.29 dBm 2DH5: 1.65 dBm 3DH5: 1.82 dBm
Operate Temp.Range	+5°C to +40°C
Note： 1. The information of the EUT is declared by the manufacturer. 2. The laboratory is not responsible for the product technical specification provided by the client.	

2. Test Sites

2.1 Test Facilities

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology Co., Ltd.

Add.: No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou,Guangdong,510663, People's Republic of China

Telephone : +86-20-32293888

Fax : +86-20-32293889

FCC(Test firm designation number：CN1282)

IC(Test firm CAB identifier number：CN0103)

2.2 Description of Non-standard Method and Deviations

The testing and measurement methods used in this report are applied by all standard methods. Not any non-standard method or deviation from the used standards was used.

2.3 List of Test and Measurement Instruments

Refer to **Appendix A**.

3. Test Configuration

3.1 Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate and different channels. Preliminary tests have been done on all the configuration for confirming worst case. Data rate and channel below means worst-case rate of each test item.

Worst-case data rates and channles are shown as following table.

Test Mode	Antenna Delivery	Test Channel
DH1/DH3/DH5 2DH1/2DH3/2DH5 3DH1/3DH3/3DH5	1TX / 1RX	0,39,78,hop

Test Mode	Test Modes	Test Channels
Conducted Emissions	3DH5	78
Radiated Emissions	3DH5	78
Peak Power Output -Conducted	DH5/2DH5/3DH5	0,39,78
20dB Emission Bandwidth	DH5/2DH5/3DH5	0,39,78
Occupied Channel Bandwidth	DH5/2DH5/3DH5	0,39,78
Frequency Separation	DH5/2DH5/3DH5	hop
Time of Occupancy (Dwell Time)	DH1/DH3/DH5/ 2DH1/2DH3/2DH5/ 3DH1/3DH3/3DH5	hop
Band Edge Compliance	DH5/2DH5/3DH5	0,78
Number of Hopping Frequency	DH5/2DH5/3DH5	hop
Spurious RF Conducted Emissions	DH5/2DH5/3DH5	0,39,78

3.2 Duty cycle

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
DH5	Ant1	2402	2.87	3.74	76.74	---	---
	Ant1	2441	2.87	3.75	76.53	---	---
	Ant1	2480	2.87	3.75	76.53	---	---
2DH5	Ant1	2402	2.88	3.75	76.80	---	---
	Ant1	2441	2.88	3.76	76.60	---	---
	Ant1	2480	2.88	3.75	76.80	---	---
3DH5	Ant1	2402	2.88	3.75	76.80	---	---
	Ant1	2441	2.89	3.76	76.86	---	---
	Ant1	2480	2.89	3.75	77.07	---	---

4. Summary of measurement results

Summary of measurements of results	Clause in FCC rules	Verdict	Note
Conducted Emissions	15.207	PASS	/
Radiated Emissions	15.247(d),15.205,15.209	PASS	/
Peak Power Output -Conducted	15.247(b)(1)	PASS	/
20dB Emission Bandwidth	15.247(a)(1)	PASS	/
Occupied Channel Bandwidth	15.247(a)(1)	PASS	/
Frequency Separation	15.247(a)(1)	PASS	/
Time of Occupancy (Dwell Time)	15.247(a)(1)(iii)	PASS	/
Band Edge Compliance	15.247(d)	PASS	/
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS	/
Spurious RF Conducted Emissions	15.247(d)	PASS	/

5. Measurement procedure

5.1 Conducted Emission

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

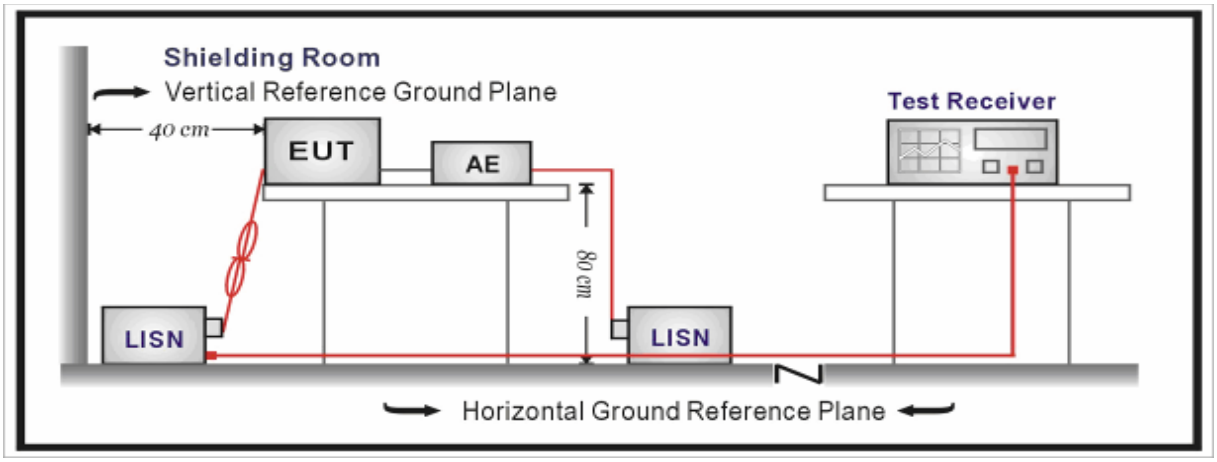
Method of Measurement:

The EUT was setup according to ANSI C63.10, 2013 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

Limits:

Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
Note 1: The lower limit shall apply at the transition frequencies. Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

Test Setup:



Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Notes:

1. *The following Quasi-Peak and Average measurements were performed on the EUT:*
2. *Final Level =Reading + Factor.*

Measurement Uncertainty：

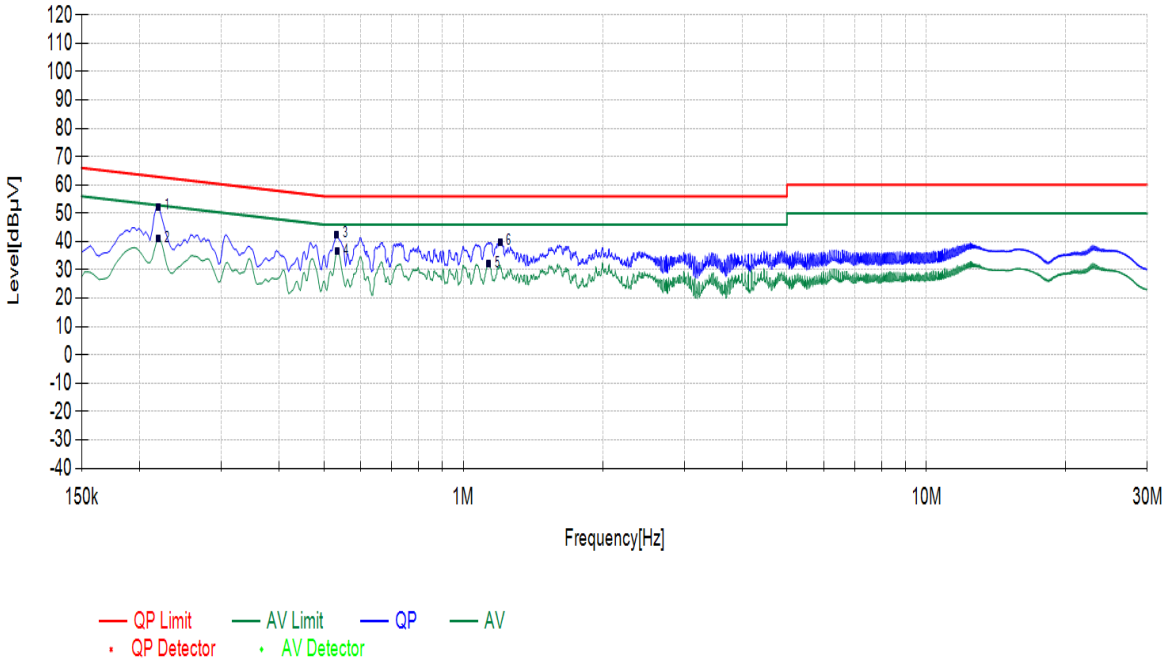
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U= 3.12 dB.

Test Results:

During the test, the Conducted Emission from 150KHz to 30MHz was performed in all modes with all channels, and all antenna. BT 8DPSK Channel 78, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

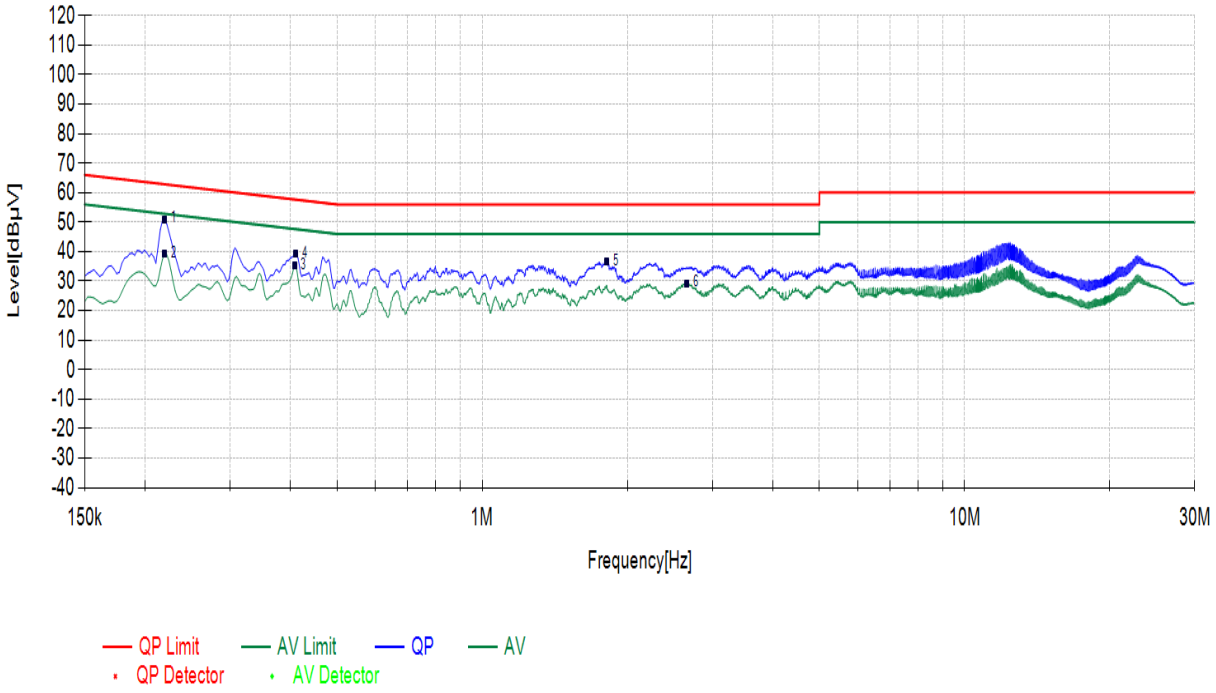
Power Line	L
Test channel	Worst-Case

Suspected List								
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV]	Limit [dBμV]	Margin [dB]	Detector	Pass/Fail
6	1.2008	10.51	29.27	39.78	56.00	16.22	QP	PASS
1	0.2198	10.46	41.72	52.18	62.83	10.65	QP	PASS
3	0.5325	10.48	31.94	42.42	56.00	13.58	QP	PASS
4	0.5348	10.48	25.94	36.42	46.00	9.58	AV	PASS
5	1.1355	10.51	21.48	31.99	46.00	14.01	AV	PASS
2	0.2198	10.46	30.54	41.00	52.83	11.83	AV	PASS



Power Line	N
Test channel	Worst-Case

Suspected List								
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Pass/Fail
1	0.2198	10.27	40.75	51.02	62.83	11.81	QP	PASS
4	0.4110	10.29	28.81	39.10	57.63	18.53	QP	PASS
5	1.8150	10.35	26.15	36.50	56.00	19.50	QP	PASS
2	0.2198	10.27	28.93	39.20	52.83	13.63	AV	PASS
6	2.6588	10.39	18.74	29.13	46.00	16.87	AV	PASS
3	0.4088	10.29	24.93	35.22	47.67	12.45	AV	PASS



5.2 Radiated Emission

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement:

The EUT was setup and tested according to ANSI C63.10, 2013.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from Antenna to the EUT was 3 meters.

The Antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the Antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

Note: When doing emission measurement above 1GHz, the horn Antenna will be bended down a little (as horn

Antenna has the narrow beamwidth) in order to keeping the Antenna in the “cone of radiation” of EUT. The 3dB beamwidth is 10~60 degrees for H-plane and 10~90 degrees for E-plane.

Limits:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Frequency	Limit (dBμV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Level
88MHz-216MHz	43.5	Quasi-peak Level
216MHz-960MHz	46.0	Quasi-peak Level
960MHz-1GHz	54.0	Quasi-peak Level

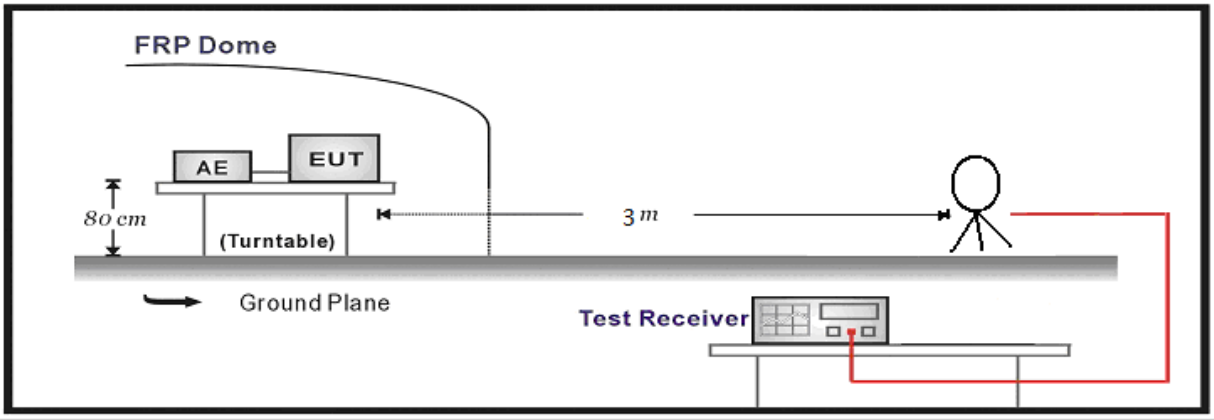
Above 1GHz	54.0	Average Level
	74.0	Peak Level

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

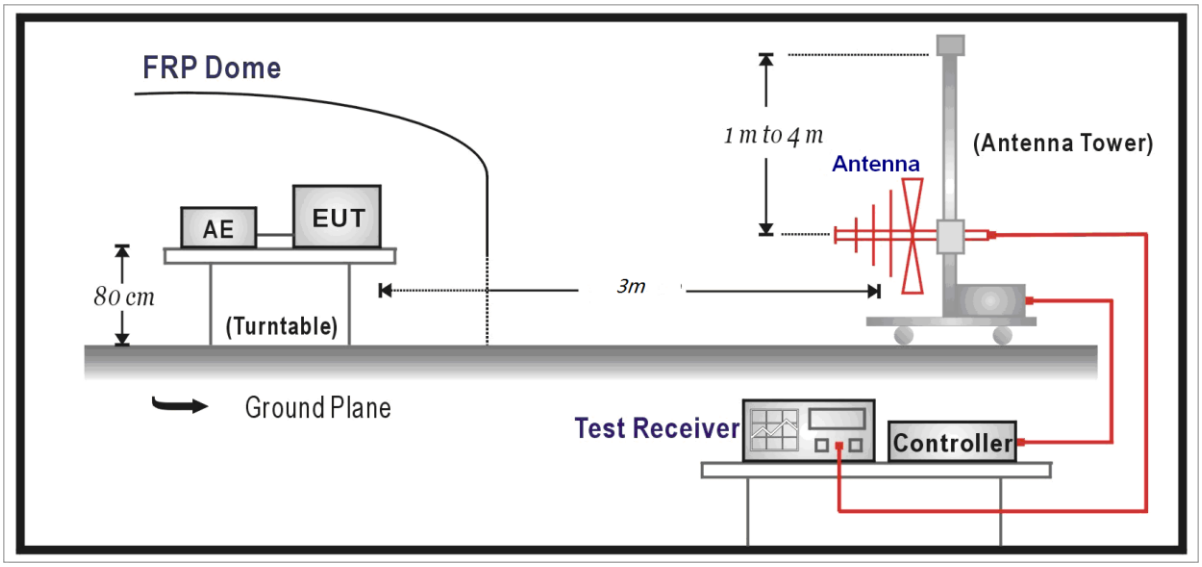
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.
12.57675-12.57725	322-335.4	3600-4400	/
13.36-13.41	/	/	/

Test Setup:

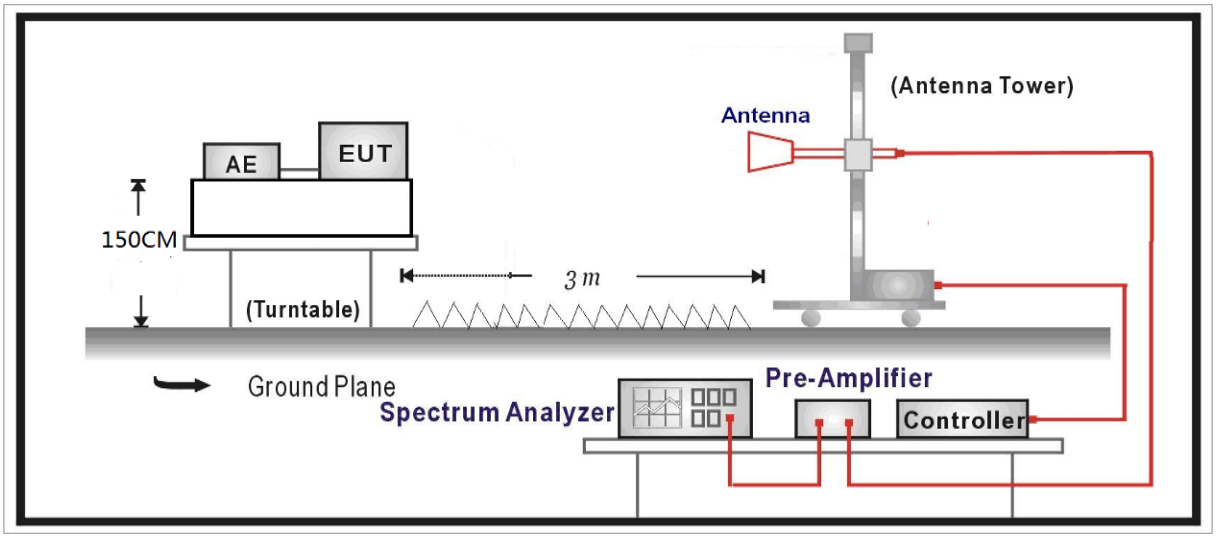
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



Measurement Data：

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Level =Reading - Factor

Factor = Preamplifier Factor – Antenna Factor–Cable Loss

Measurement Uncertainty：

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96.

Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.19 dB
200MHz-1GHz	3.63 dB
Above 1GHz	3.68 dB

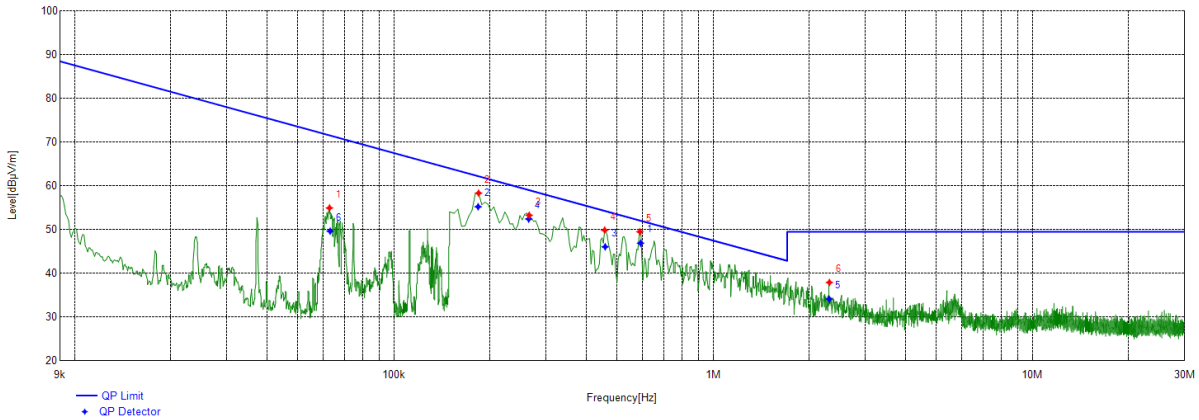
Test Results:

During the test, the Radiates Emission from 9KHz to 40GHz was performed in all modes with all channels, and all antenna, BT 8DPSK Channel 78, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

SPURIOUS EMISSIONS：

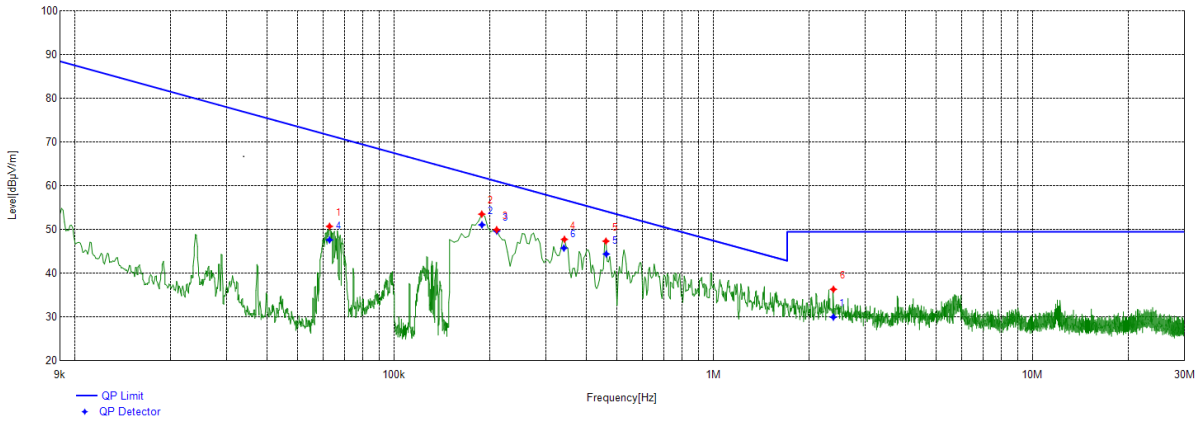
Radiated Emission	9KHz-30MHz
Polarity	X axis
Test channel	Worst-Case

Final Data List								
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
0.5922	X axis	19.67	46.93	52.06	5.13	300	111	PASS
0.1835	X axis	19.49	55.26	62.25	6.99	180	120	PASS
0.4587	X axis	19.64	46.09	54.28	8.19	120	123	PASS
0.2643	X axis	19.49	52.45	59.07	6.62	270	140	PASS
2.3089	X axis	19.91	34.14	49.50	15.36	110	131	PASS
0.0631	X axis	19.66	49.67	71.54	21.87	170	198	PASS



Radiated Emission	9KHz-30MHz
Polarity	Y axis
Test channel	Worst-Case

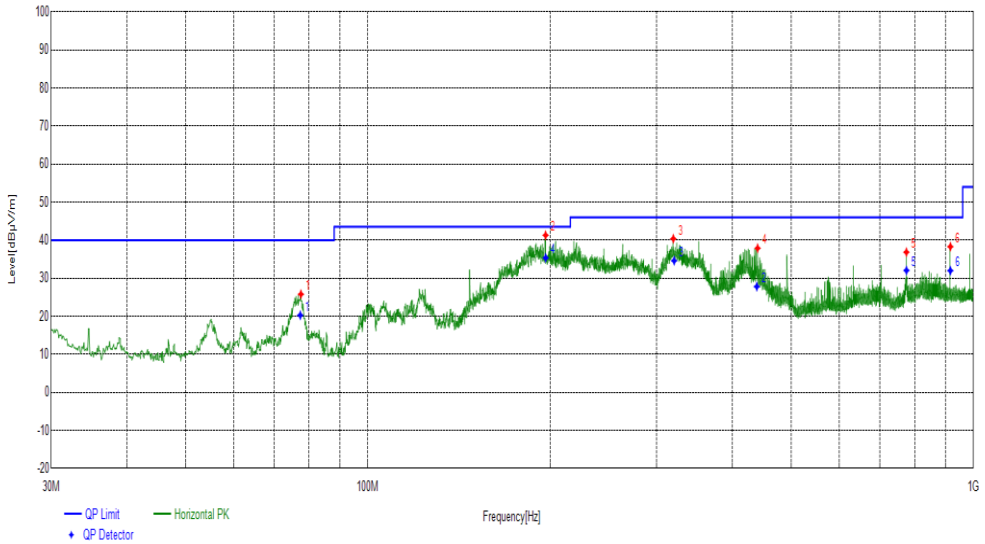
Final Data List								
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
2.3798	Y axis	19.91	30.01	49.50	19.49	280	242	PASS
0.1886	Y axis	19.48	51.12	62.01	10.89	170	207	PASS
0.2098	Y axis	19.46	49.70	61.09	11.39	280	178	PASS
0.0628	Y axis	19.66	47.67	71.58	23.91	210	144	PASS
0.4625	Y axis	19.64	44.45	54.20	9.75	120	69	PASS
0.3407	Y axis	19.55	45.80	56.86	11.06	120	65	PASS



Radiates Emission	30M~1G
Test channel	Worst-Case

Suspected List										
Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
77.5348	Horizontal	8.93	16.87	25.80	40.00	14.20	PK	100	30	PASS
196.5657	Horizontal	12.84	28.46	41.30	43.52	2.22	PK	100	186	PASS
319.4769	Horizontal	15.97	24.42	40.39	46.02	5.63	PK	100	30	PASS
440.1570	Horizontal	18.61	19.29	37.90	46.02	8.12	PK	100	34	PASS
774.9375	Horizontal	24.24	12.61	36.85	46.02	9.17	PK	100	339	PASS
916.0866	Horizontal	25.99	12.31	38.30	46.02	7.72	PK	100	348	PASS

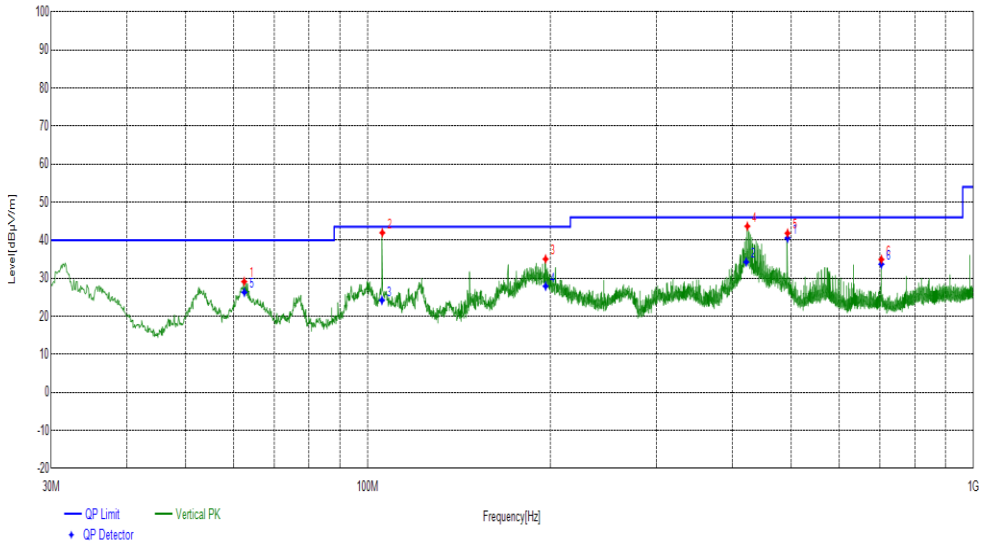
Final Data List								
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
77.3429	Horizontal	8.93	20.28	40.00	19.72	270	35	PASS
438.8066	Horizontal	18.61	27.82	46.02	18.20	130	39	PASS
320.4524	Horizontal	15.97	34.61	46.02	11.41	150	35	PASS
196.6141	Horizontal	12.84	35.37	43.52	8.15	160	191	PASS
775.0948	Horizontal	24.23	32.05	46.02	13.97	180	344	PASS
916.0202	Horizontal	25.99	32.00	46.02	14.02	200	353	PASS



Radiates Emission	30M~1G
Test channel	Worst-Case

Suspected List										
Frequency [MHz]	Polarity	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
62.4983	Vertical	11.53	17.58	29.11	40.00	10.89	PK	100	226	PASS
105.6676	Vertical	11.71	30.25	41.96	43.52	1.56	PK	100	90	PASS
196.5657	Vertical	12.84	22.21	35.05	43.52	8.47	PK	100	107	PASS
423.3743	Vertical	18.31	25.34	43.65	46.02	2.37	PK	100	60	PASS
493.2213	Vertical	19.59	22.25	41.84	46.02	4.18	PK	100	4	PASS
704.7025	Vertical	23.27	11.67	34.94	46.02	11.08	PK	100	357	PASS

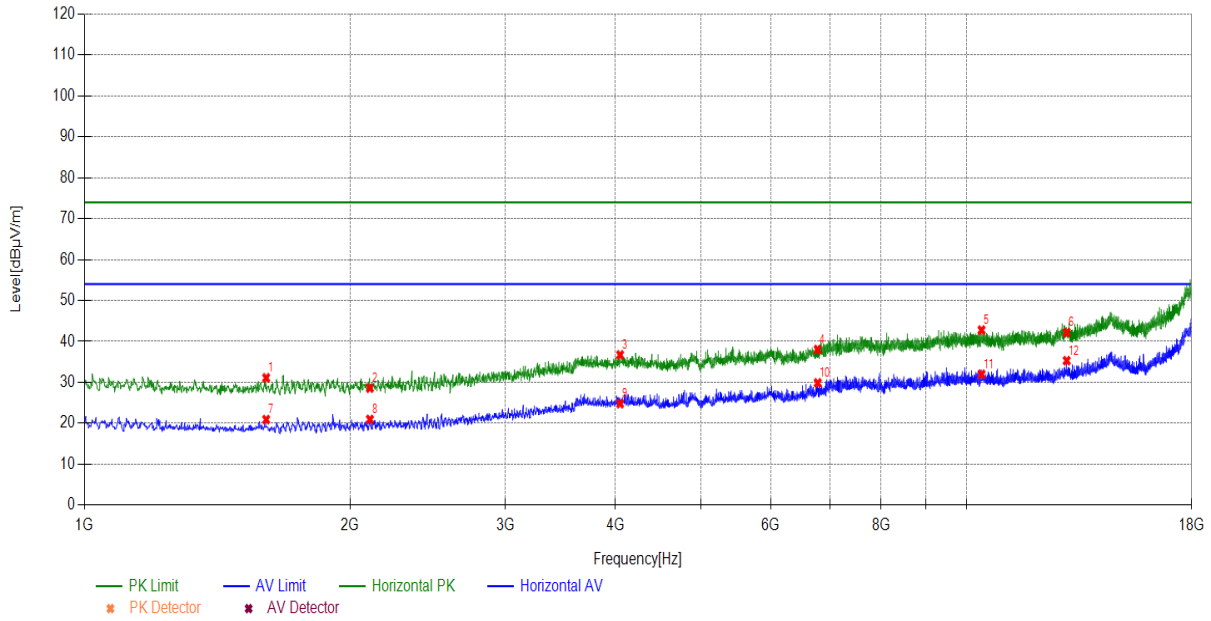
Final Data List								
Frequency [MHz]	Polarity	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Pass/Fail
493.2499	Vertical	19.59	40.54	46.02	5.48	200	70	PASS
421.5362	Vertical	18.31	34.27	46.02	11.75	130	65	PASS
105.5117	Vertical	11.71	24.20	43.52	19.32	240	95	PASS
196.6112	Vertical	12.84	27.91	43.52	15.61	110	112	PASS
62.5272	Vertical	11.53	26.31	40.00	13.69	120	231	PASS
704.6410	Vertical	23.27	33.71	46.02	12.31	290	80	PASS



Radiates Emission	1G~18G
Test channel	Worst-Case
polarization	Horizontal

Suspected List

Frequency[MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
1606.9607	-9.07	40.19	31.12	74.00	42.88	PK	150	160	PASS
2106.8107	-7.59	36.21	28.62	74.00	45.38	PK	150	150	PASS
4048.4048	-2.24	38.96	36.72	74.00	37.28	PK	150	210	PASS
6780.5781	3.89	34.15	38.04	74.00	35.96	PK	150	360	PASS
10400.24	8.33	34.45	42.78	74.00	31.22	PK	150	350	PASS
12989.599	9.67	32.52	42.19	74.00	31.81	PK	150	70	PASS
1606.9607	-9.07	30.00	20.93	54.00	33.07	AV	150	10	PASS
2106.8107	-7.59	28.54	20.95	54.00	33.05	AV	150	10	PASS
4048.4048	-2.24	27.07	24.83	54.00	29.17	AV	150	20	PASS
6780.5781	3.89	25.99	29.88	54.00	24.12	AV	150	10	PASS
10400.24	8.33	23.64	31.97	54.00	22.03	AV	150	10	PASS
12989.599	9.67	25.64	35.31	54.00	18.69	AV	150	10	PASS

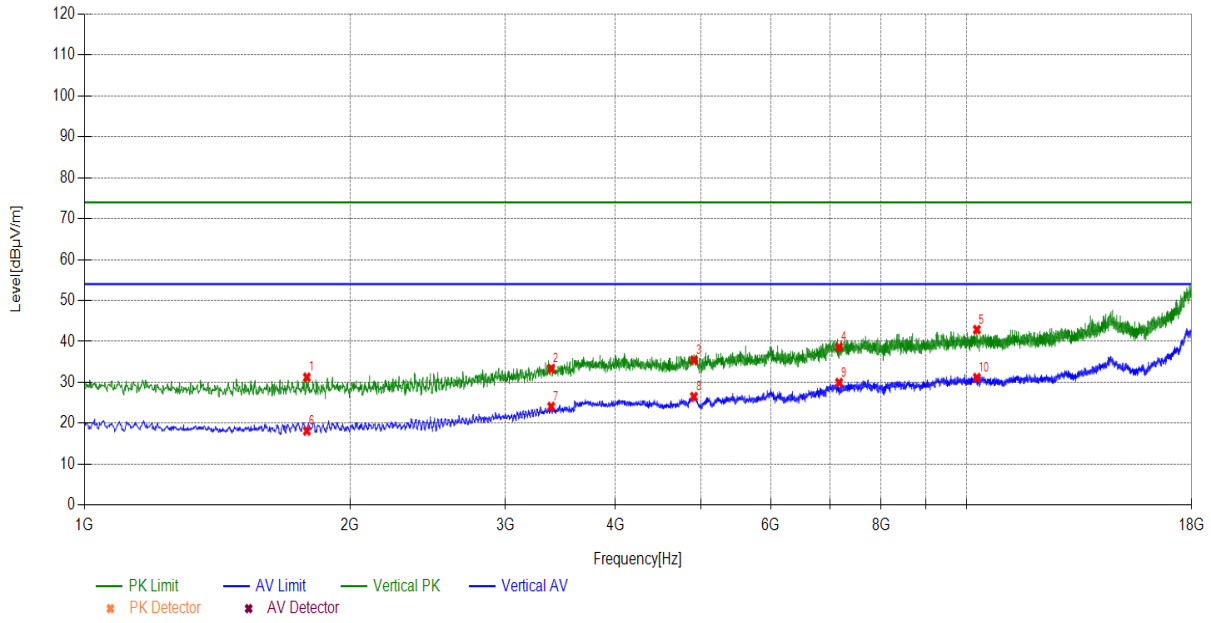


Note: The signal beyond the limit is carrier

Radiates Emission	1G~18G
Test channel	Worst-Case
polarization	Vertical

Suspected List

Frequency[MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
1787.1787	-9.15	41.60	32.45	74.00	41.55	PK	150	340	PASS
3381.9382	-5.43	36.12	30.69	74.00	43.31	PK	150	10	PASS
4908.6909	-2.85	36.32	33.47	74.00	40.53	PK	150	280	PASS
7169.917	4.69	35.44	40.13	74.00	33.87	PK	150	10	PASS
10274.4274	8.54	31.29	39.83	74.00	34.17	PK	150	10	PASS
1787.1787	13.48	33.66	47.14	74.00	26.86	AV	150	280	PASS
3381.9382	-9.15	28.70	19.55	54.00	34.45	AV	150	30	PASS
4908.6909	-5.43	27.78	22.35	54.00	31.65	AV	150	50	PASS
7169.917	-2.85	27.17	24.32	54.00	29.68	AV	150	50	PASS
10274.4274	4.69	14.70	19.39	54.00	34.61	AV	150	100	PASS

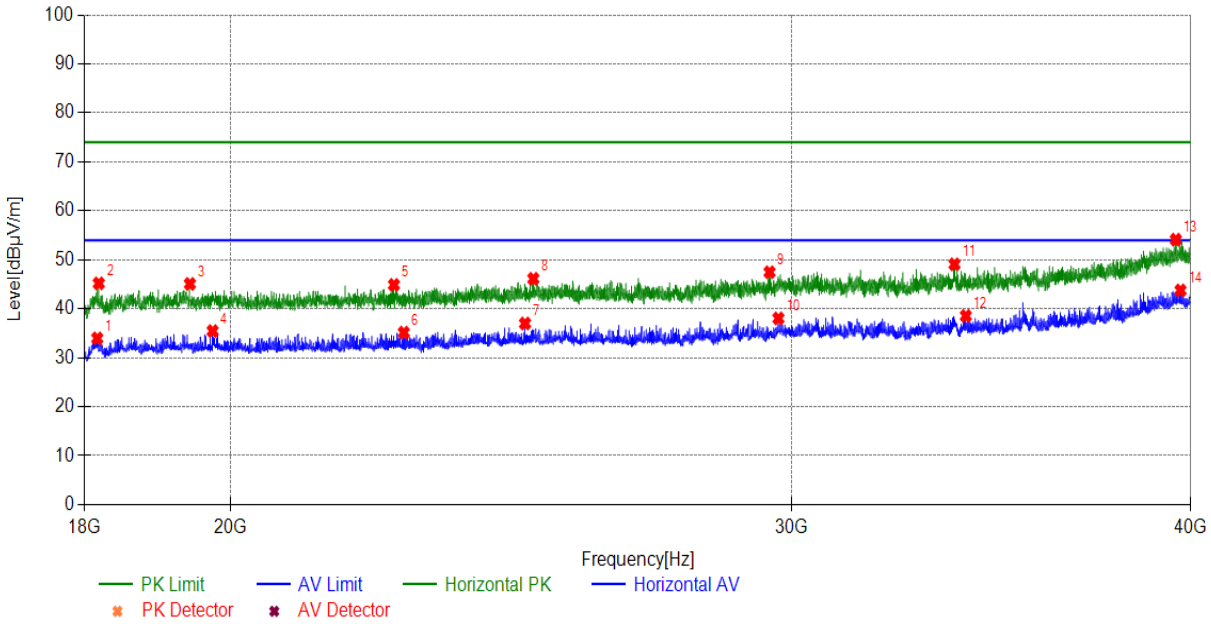


Note: The signal beyond the limit is carrier

Radiates Emission	18G~40G
Test channel	Worst-Case
polarization	Horizontal

Suspected List

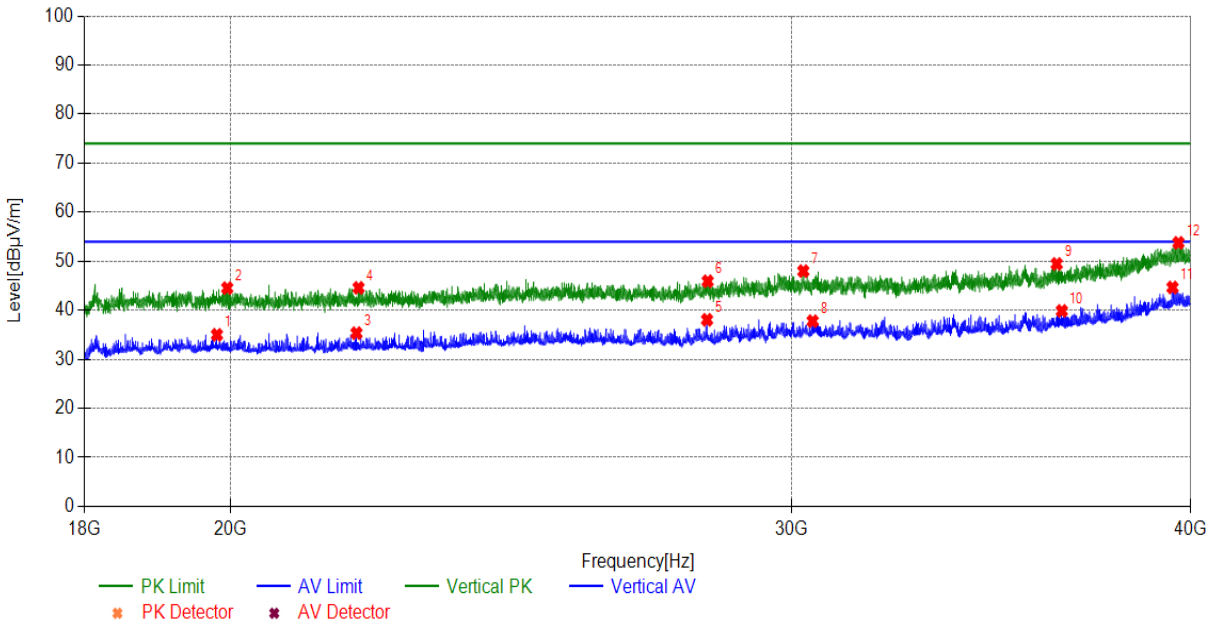
Frequency[MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
19423.5424	1.33	43.74	45.07	74.00	28.93	PK	150	100	PASS
24888.8889	4.06	42.06	46.12	74.00	27.88	PK	150	60	PASS
39575.3575	10.78	43.33	54.11	74.00	19.89	PK	150	150	PASS
18187.0187	1.15	44.03	45.18	74.00	28.82	PK	150	60	PASS
33731.5732	6.52	42.56	49.08	74.00	24.92	PK	150	180	PASS
22506.0506	2.41	42.47	44.88	74.00	29.12	PK	150	90	PASS
29515.9516	6.36	41.10	47.46	74.00	26.54	PK	150	170	PASS
19744.7745	1.31	34.14	35.45	54.00	18.55	AV	150	10	PASS
22666.6667	2.57	32.56	35.13	54.00	18.87	AV	150	10	PASS
24739.2739	4.00	32.99	36.99	54.00	17.01	AV	150	10	PASS
39709.5710	10.79	32.95	43.74	54.00	10.26	AV	150	10	PASS
29705.1705	6.49	31.53	38.02	54.00	15.98	AV	150	10	PASS
34008.8009	6.60	31.94	38.54	54.00	15.46	AV	150	10	PASS
18167.2167	1.14	32.82	33.96	54.00	20.04	AV	150	10	PASS



Radiates Emission	18G~40G
Test channel	Worst-Case
polarization	Vertical

Suspected List

Frequency[MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/Fail
39650.1650	10.78	42.97	53.75	74.00	20.25	PK	150	230	PASS
19953.7954	1.30	43.22	44.52	74.00	29.48	PK	150	150	PASS
28226.6227	5.54	40.37	45.91	74.00	28.09	PK	150	190	PASS
30244.2244	6.59	41.39	47.98	74.00	26.02	PK	150	200	PASS
36314.6315	7.38	42.06	49.44	74.00	24.56	PK	150	30	PASS
21938.3938	1.88	42.69	44.57	74.00	29.43	PK	150	270	PASS
39480.7481	10.77	33.87	44.64	54.00	9.36	AV	150	10	PASS
28213.4213	5.53	32.52	38.05	54.00	15.95	AV	150	10	PASS
21905.3905	1.88	33.45	35.33	54.00	18.67	AV	150	10	PASS
36448.8449	7.48	32.39	39.87	54.00	14.13	AV	150	10	PASS
30448.8449	6.50	31.27	37.77	54.00	16.23	AV	150	10	PASS
19806.3806	1.31	33.68	34.99	54.00	19.01	AV	150	10	PASS



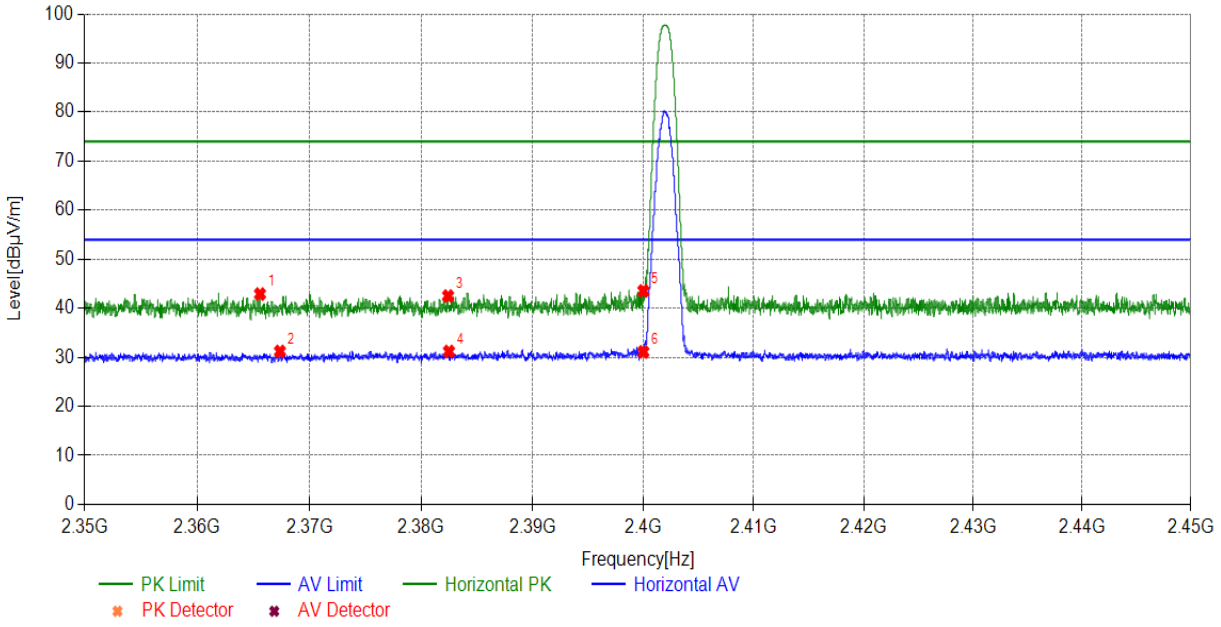
Band Edge：

During the test, the Band Edge was performed in BLE all modes with all channels and all antenna.
BT 8DPSK, antenna 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Test mode	8DPSK
Test channel	Lowest channel
polarization	Horizontal

Suspected List

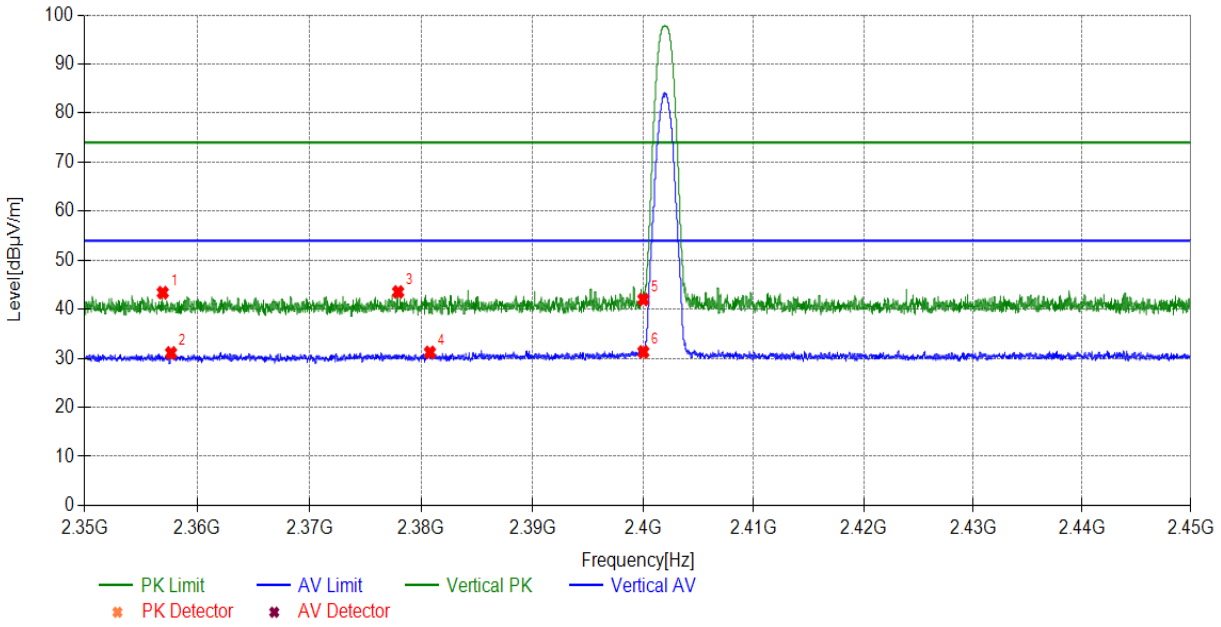
Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2365.5916	29.58	13.32	42.90	74.00	31.10	PK	100	10	PASS
2382.4132	29.62	12.88	42.50	74.00	31.50	PK	100	20	PASS
2400.0050	29.67	13.86	43.53	74.00	30.47	PK	100	20	PASS
2367.3717	29.58	1.62	31.20	54.00	22.80	AV	100	10	PASS
2382.4932	29.62	1.57	31.19	54.00	22.81	AV	100	10	PASS
2400.0050	29.67	1.43	31.10	54.00	22.90	AV	100	20	PASS



Test mode	8DPSK
Test channel	Lowest channel
polarization	Vertical

Suspected List

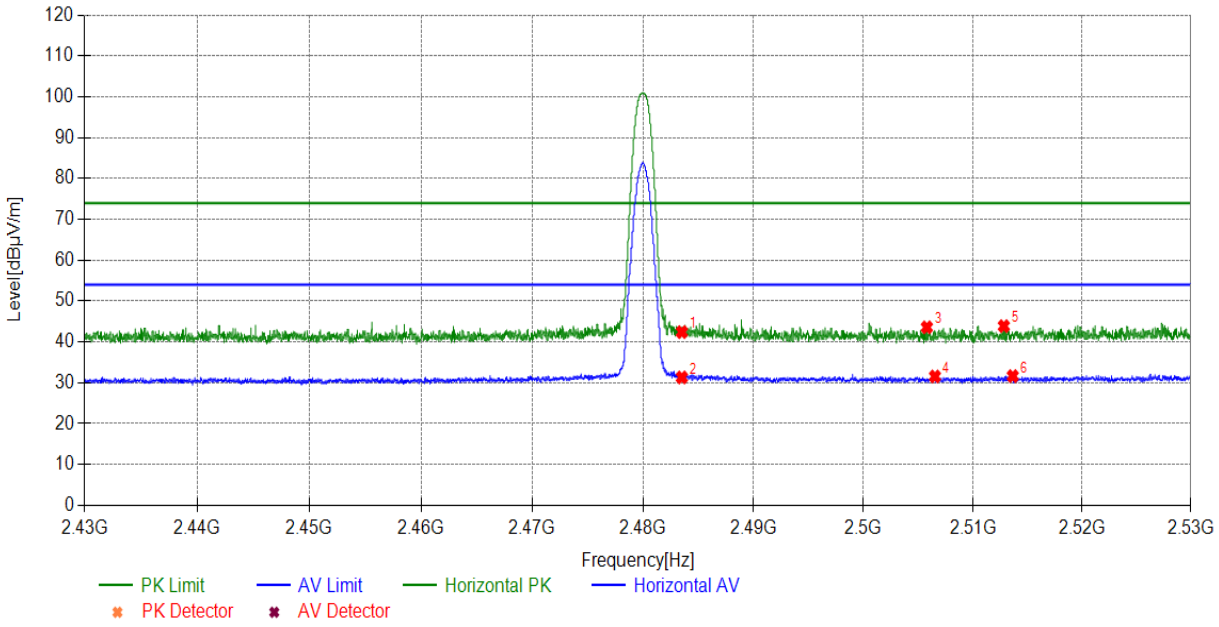
Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2356.9407	29.55	13.83	43.38	74.00	30.62	PK	100	30	PASS
2377.9328	29.61	13.91	43.52	74.00	30.48	PK	100	20	PASS
2400.0050	29.67	12.32	41.99	74.00	32.01	PK	100	20	PASS
2357.6808	29.55	1.54	31.09	54.00	22.91	AV	100	20	PASS
2380.7831	29.62	1.58	31.20	54.00	22.80	AV	100	20	PASS
2400.0050	29.67	1.62	31.29	54.00	22.71	AV	100	20	PASS



Test mode	8DPSK
Test channel	Highest channel
polarization	Horizontal

Suspected List

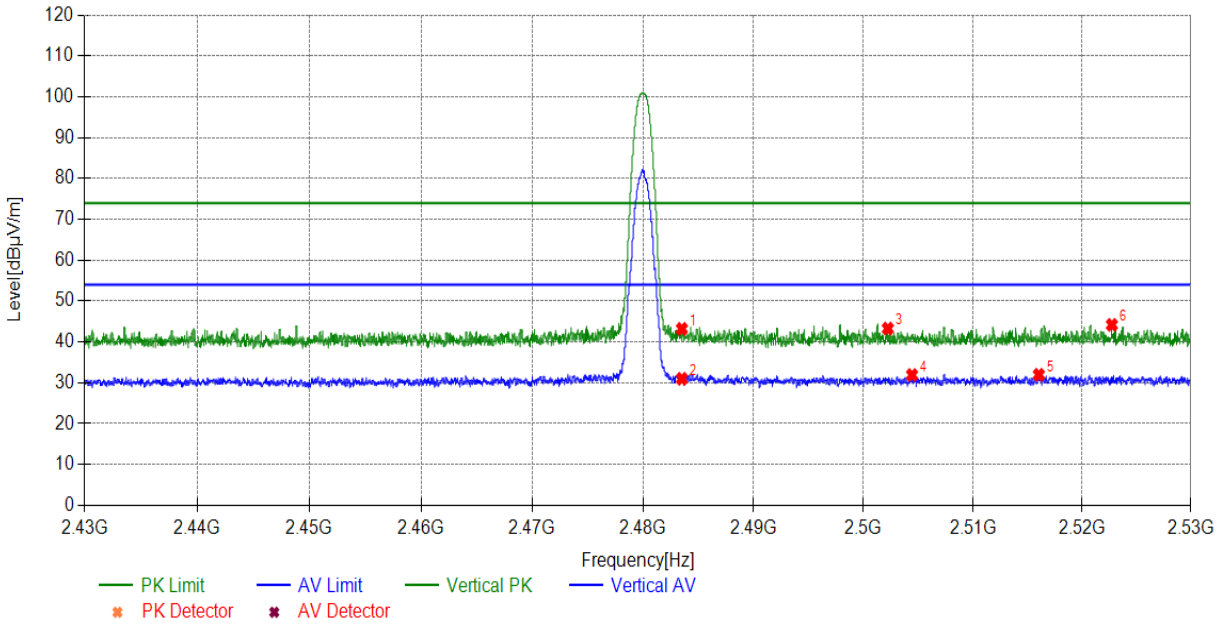
Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2483.5054	29.91	12.50	42.41	74.00	31.59	PK	100	30	PASS
2505.7876	29.98	13.60	43.58	74.00	30.42	PK	100	50	PASS
2512.8283	30.01	13.86	43.87	74.00	30.13	PK	100	20	PASS
2483.5054	29.91	1.41	31.32	54.00	22.68	AV	100	40	PASS
2506.5277	29.99	1.57	31.56	54.00	22.44	AV	100	30	PASS
2513.6484	30.02	1.63	31.65	54.00	22.35	AV	100	20	PASS



Test mode	8DPSK
Test channel	Highest channel
polarization	Vertical

Suspected List

Frequency [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Detector	Height [cm]	Angle deg	Pass/ Fail
2522.7493	30.05	14.14	44.19	74.00	29.81	PK	100	20	PASS
2483.5054	29.91	13.28	43.19	74.00	30.81	PK	100	20	PASS
2502.2272	29.97	13.30	43.27	74.00	30.73	PK	100	20	PASS
2504.4374	29.98	1.93	31.91	54.00	22.09	AV	100	10	PASS
2516.0386	30.03	1.93	31.96	54.00	22.04	AV	100	10	PASS
2483.5054	29.91	1.08	30.99	54.00	23.01	AV	100	10	PASS



5.3 Peak Power Output -Conducted

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement:

During the process of the testing, The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The EUT is controlled by the Bluetooth test set to ensure max power transmission with proper modulation. The peak detector is used.

Limits:

Rule Part 15.247 (b) (1)specifies that " For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts."

Peak Output Power	≤ 0.125W (21dBm)

Test Setup:

Measurement Uncertainty：

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.44 dB.

Test Results:

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	2.95	≤20.97	PASS
	Ant1	2441	3.02	≤20.97	PASS
	Ant1	2480	4.29	≤20.97	PASS
2DH5	Ant1	2402	0.29	≤20.97	PASS
	Ant1	2441	0.37	≤20.97	PASS
	Ant1	2480	1.65	≤20.97	PASS
3DH5	Ant1	2402	0.43	≤20.97	PASS
	Ant1	2441	0.51	≤20.97	PASS
	Ant1	2480	1.82	≤20.97	PASS

5.4 20dB Emission Bandwidth

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement:

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 20 kHz; VBW is set to 100 kHz on spectrum analyzer.
Detector=Peak, Trace mode=Max hold.

Limits:

No specific occupied bandwidth requirements in part 15.247(a) (1).

Test Setup:

Measurement Uncertainty：

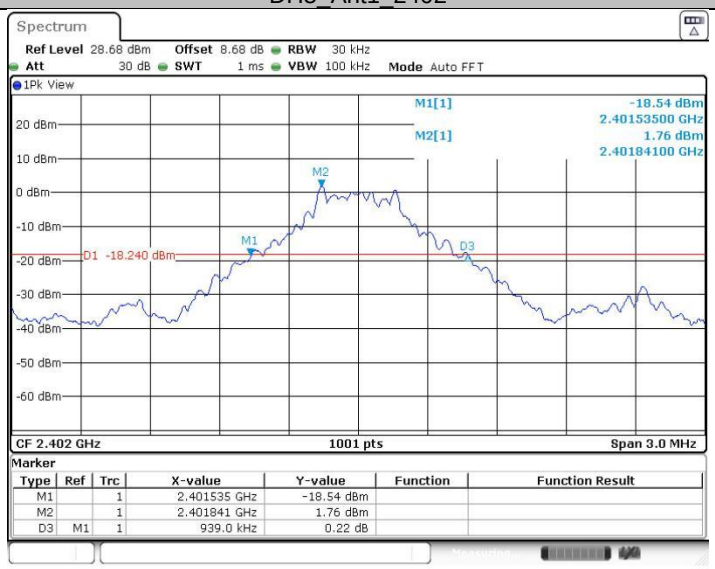
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 936 Hz.

Test Results:

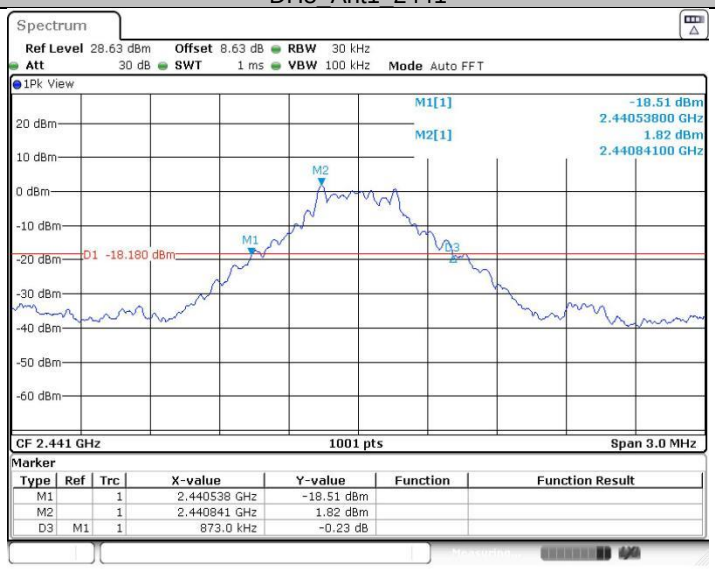
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.94	2401.535	2402.475	---	PASS
	Ant1	2441	0.87	2440.538	2441.408	---	PASS
	Ant1	2480	0.93	2479.538	2480.468	---	PASS
2DH5	Ant1	2402	1.22	2401.391	2402.611	---	PASS
	Ant1	2441	1.22	2440.382	2441.602	---	PASS
	Ant1	2480	1.23	2479.376	2480.606	---	PASS
3DH5	Ant1	2402	1.24	2401.367	2402.607	---	PASS
	Ant1	2441	1.24	2440.370	2441.610	---	PASS
	Ant1	2480	1.25	2479.364	2480.614	---	PASS

Test Graphs

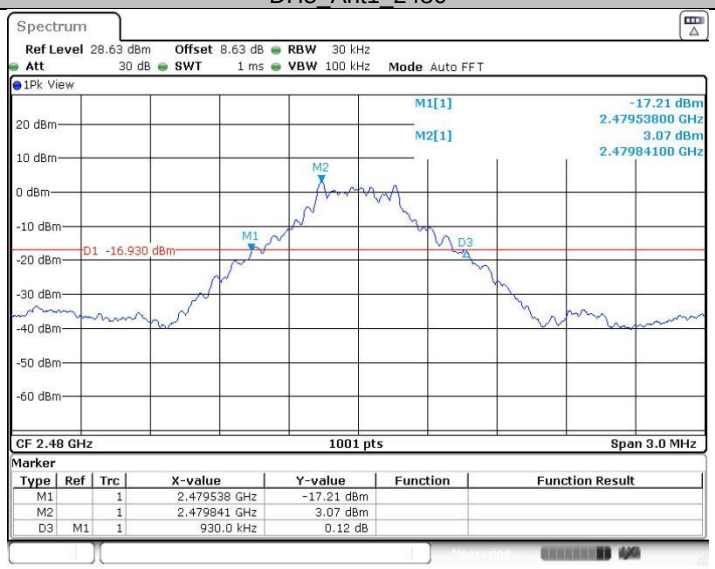
DH5_Ant1_2402



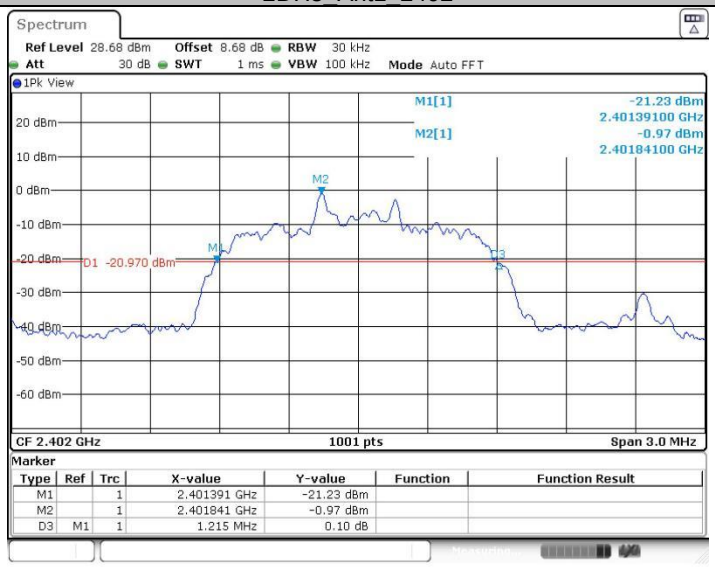
DH5_Ant1_2441



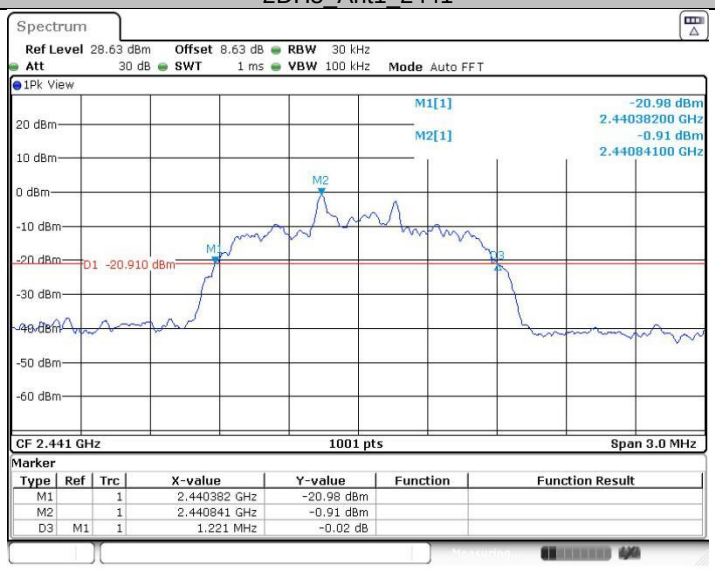
DH5_Ant1_2480



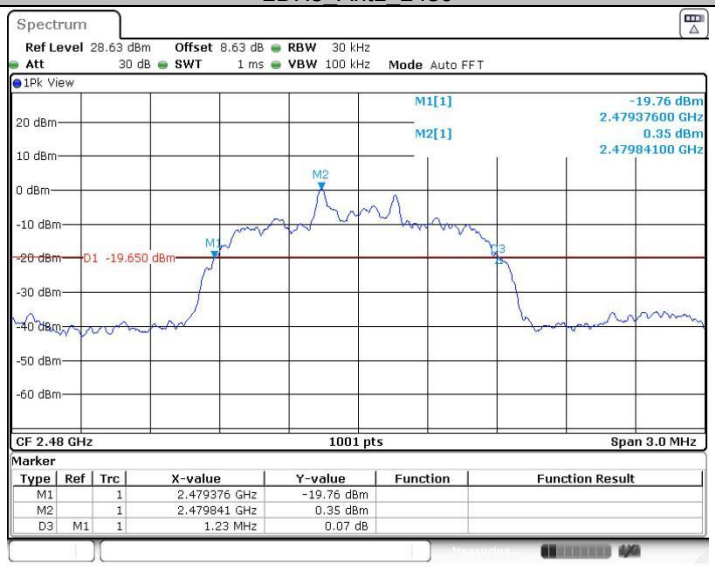
2DH5_Ant1_2402



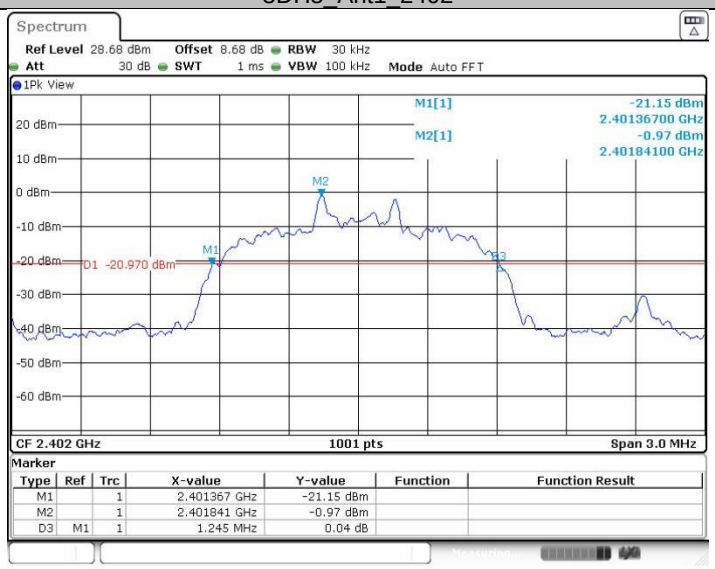
2DH5_Ant1_2441



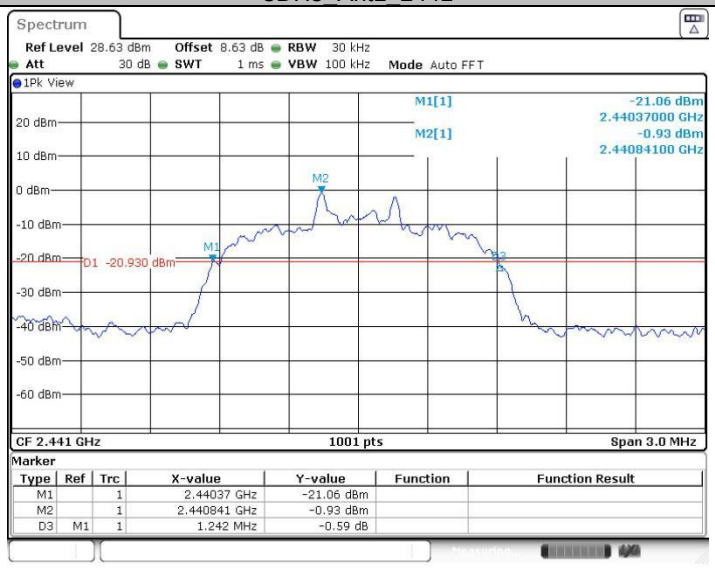
2DH5_Ant1_2480



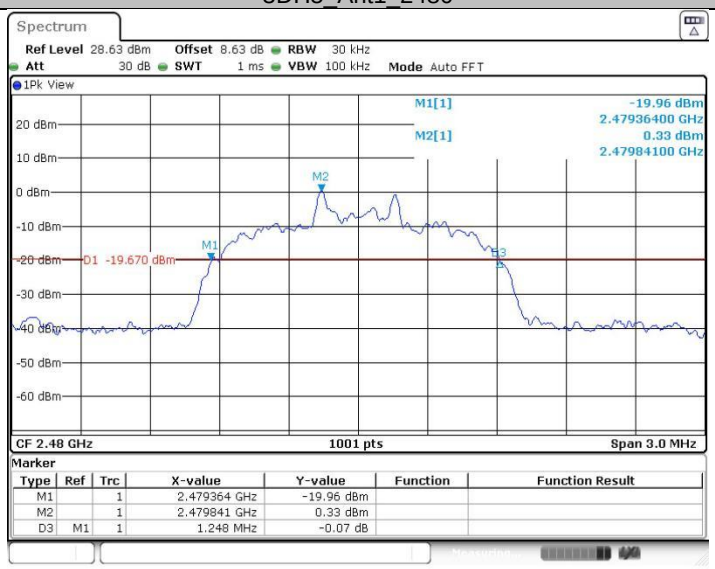
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



5.5 Occupied Channel Bandwidth

Ambient condition:

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement:

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 20 kHz; VBW is set to 100 kHz on spectrum analyzer.
Detector=Peak, Trace mode=Max hold.

Limits:

No specific occupied bandwidth requirements in part 15.247(a) (1).

Test Setup:

Measurement Uncertainty：

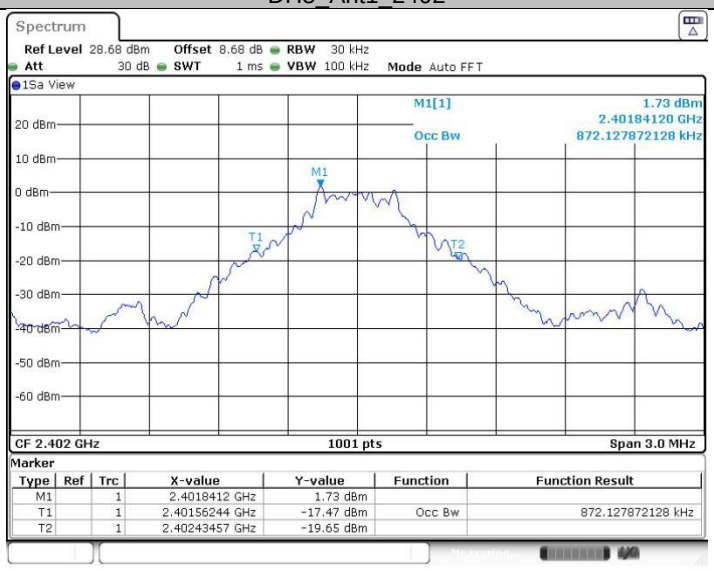
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 936 Hz.

Test Results:

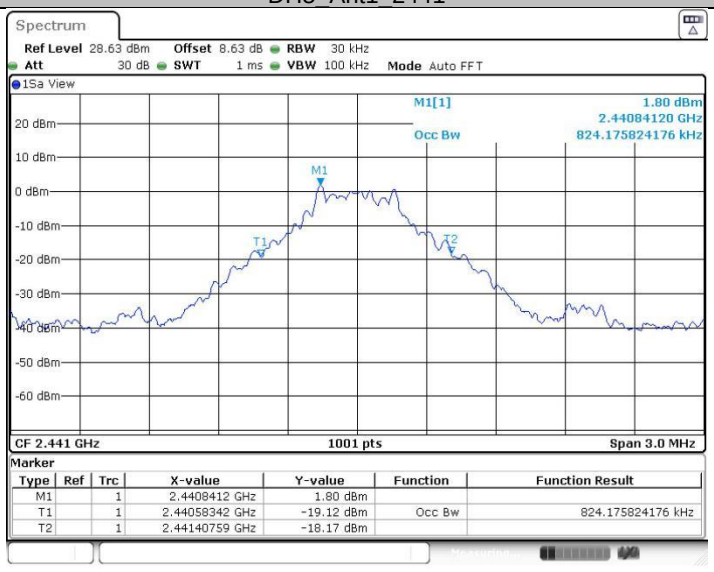
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.872	2401.562	2402.435	---	---
	Ant1	2441	0.824	2440.583	2441.408	---	---
	Ant1	2480	0.818	2479.586	2480.405	---	---
2DH5	Ant1	2402	1.157	2401.419	2402.575	---	---
	Ant1	2441	1.151	2440.419	2441.569	---	---
	Ant1	2480	1.16	2479.416	2480.575	---	---
3DH5	Ant1	2402	1.163	2401.422	2402.584	---	---
	Ant1	2441	1.154	2440.422	2441.575	---	---
	Ant1	2480	1.16	2479.419	2480.578	---	---

Test Graphs

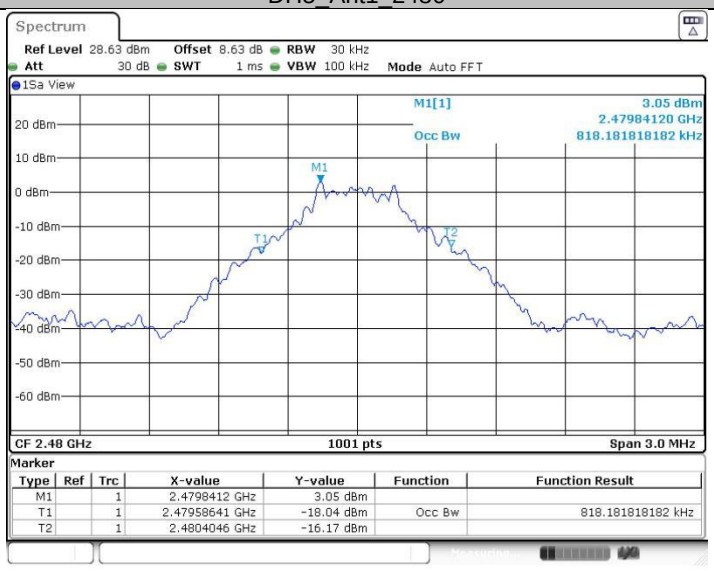
DH5_Ant1_2402



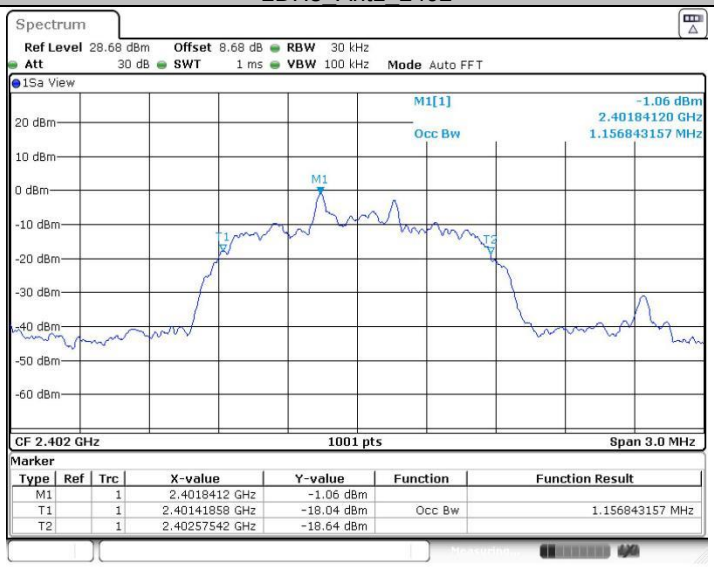
DH5_Ant1_2441



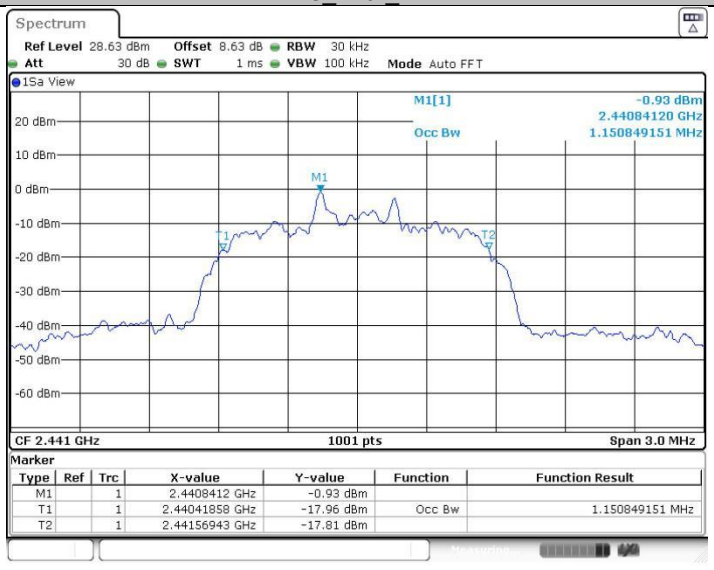
DH5_Ant1_2480



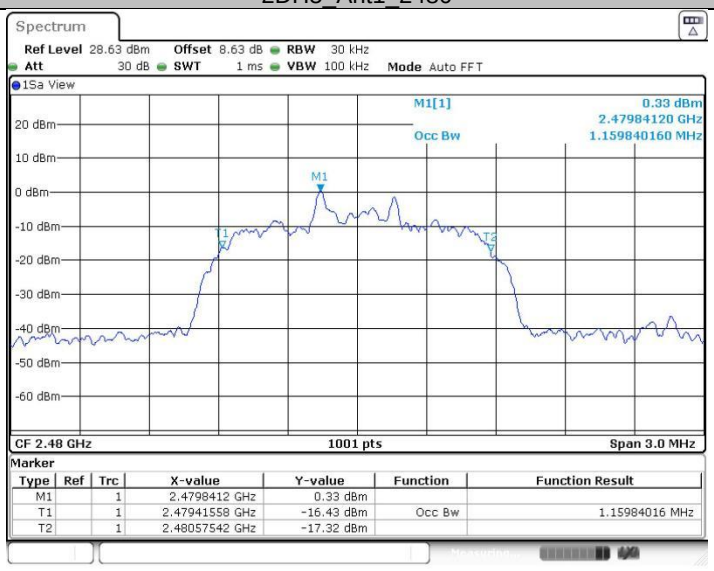
2DH5_Ant1_2402



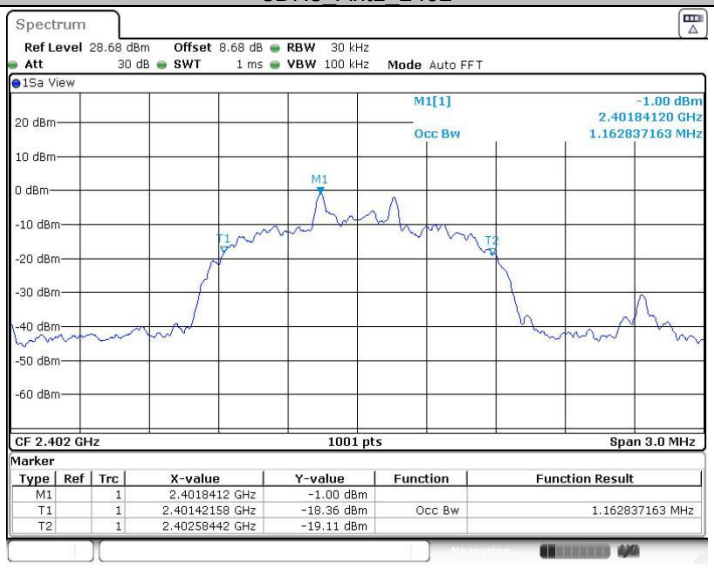
2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441